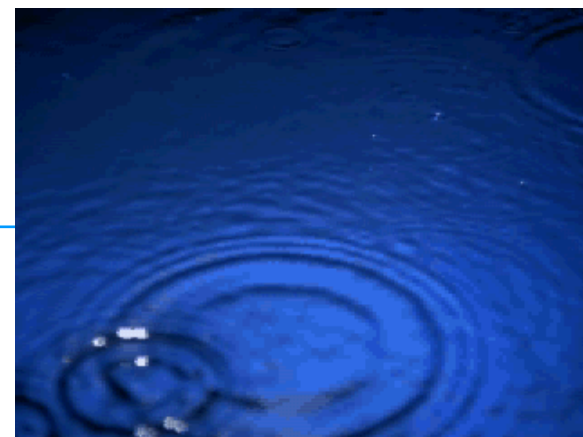


Global Precipitation Measurement

Mission Assurance

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Mission Assurance Requirements (MAR) plan is being developed from the Mission Assurance Guidelines (MAG) 300-PG-7120.2.2. The MAR will include:

- Verification*
- Reliability*
- Parts and Materials*
- Software*
- Risk Management*
- QA*
- Contamination*
- Safety*



VERIFICATION

- ***The MAR requires a verification program to ensure that the GPM flight system meets the mission requirements.***
- ***The General Environmental Verification Specification(GEVS) will be used as a baseline guide in developing the verification program.***
 - ***Core spacecraft***
 - ***Constellation space segment***
 - ***NASA provided instruments***



RELIABILITY

- ***A standard Reliability program will be implemented. A Failure Modes and Effect Analysis to include a critical items list will be completed at the component interface level.***
 - *Preliminary FMECA due 30 days prior to PDR*
- ***Parts Stress Analysis will be required verifying the derating guidelines.***
- ***Fault Tree Analysis will be implemented that addresses mission failures and degraded modes of operation***
- ***Worst case analysis, trend analysis and Reliability Assessment will be implemented***



PARTS AND MATERIALS

- ***The GSFC 311-INST-001 instructions for EEE parts will be applied to select, screen and qualify parts.***
 - *A level 2 parts program is being recommended.*
 - *Level 2 parts program applies to missions with low to moderate risk*
 - *GPM mission objective being 3 yrs is within Level 2 parts program mission duration which is 1 to 5 yrs.*
- ***The standard GSFC Materials and Processes requirements for an ELV launch will be applicable.***
 - *Vacuum Outgassing*
 - *Flammability and Toxic Offgassing*
 - *Stress Corrosion Cracking*
- ***GSFC approves all Parts and Materials List***



SOFTWARE ASSURANCE

- ***Software Quality Assurance Program will be implemented as part of the software development process***
- ***A verification and validation program will be implemented to ensure software being development satisfies the requirements for each phase of the development***
- ***The NASA Independent Verification and Validation team will participate in the flight software development***



RISK MANAGEMENT REQUIREMENTS

- ***Risk Management is a requirement established by NPG 7120.5. “NASA Program and Project Management Process and Requirements”***
- ***Risk Management Plan and Probabilistic Risk Assessment will be required***
 - ***Project Risk Management Plan is in review***
 - ***Preliminary Probabilistic Risk Assessment due 30 days prior to PDR***



QUALITY ASSURANCE

- Hardware will be fabricated to NASA workmanship standards*
- GSFC has been ISO 9001 certified*
- A system for identifying and reporting nonconformances will be implemented*

CONTAMINATION

- A Contamination Control Program that establishes the cleanliness requirements will be required. A GPM Contamination Control Plan will delineate the methods used to meet the cleanliness requirements.*



- ***System Safety Implementation Plan***
- ***EWR 127-1 and NASDA Safety Requirements Compliance***
- ***Missile System Prelaunch Safety Packages (MSPSP)/NASDA Equivalent***
 - *Hazard Analyses*
 - *Closed-loop Hazard Tracking System*
 - *Software Safety*
 - *Safety Assessments*
- ***Launch Site Safety Plan***
- ***Orbital Debris Assessment***

